Operating instructions

Process indicator with alarm contacts

Type:

DA11

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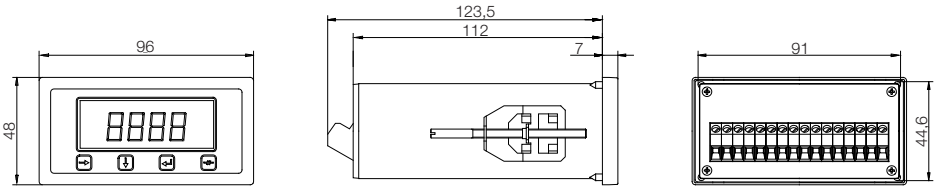

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1.0 Installation and setting into operation

1.1 Mounting

The panel cutout should be 92x45mm. After mounting the instrument to the panel, the lateral mounting clips have to be stretched against the panel.

1.2 Wiring

Electrical wiring is made the terminal block. The wiring schemes can be seen in the drawings page 15. In addition, wiring details and required power supply are given on the rating plate. For the connection and application of the mesuring instruments, the VDE regulations on working with high voltage as well as the rules and regulations of the professional associations concerning working with electrical devices and installations have to be observed.

1.3 Electrical data

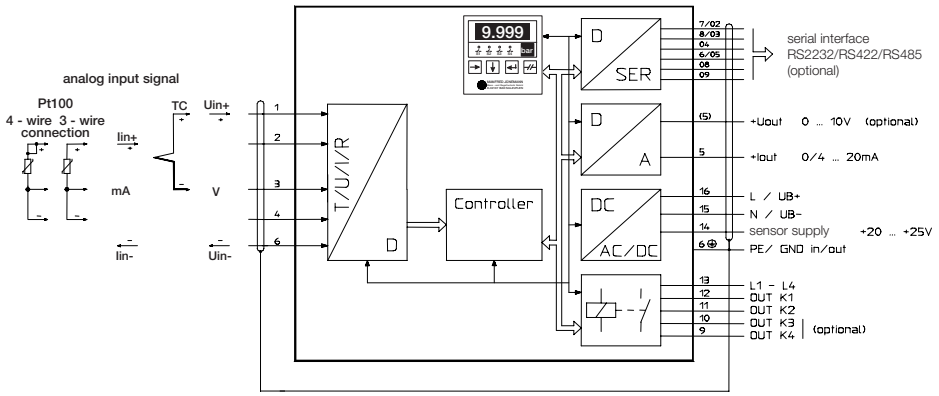
see type plate

1.4 Symbols

Ub+ / Ub-	: power supply
A+ /A-	: analog output signal
L1 / L2, K1, K2	: limit signals 1 and 2
L3 / L4, K3, K4	: limit signals 3 and 4
RxD, TxD, SGND	: seriel interface RS232
A, B, SGND	: seriel interface RS422 / RS485 halb-duplex
-RxD, +RxD, -TxD, +TxD, SGND	: seriel interface RS422 / RS485 full-duplex
PE	: earth of thread connection / flange connection

Analog input signal:

mA+ / mA-	: [I] current
V+ / V-	: [U] voltage
TC+ / TC-	: [T] Thermocouples
Pt100+ / Pt100- / Pt100	: Pt100, 3-wire



Attention: You must use a shielded cable.

Wiring schemes: see page 15

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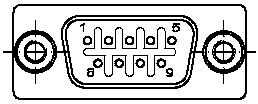
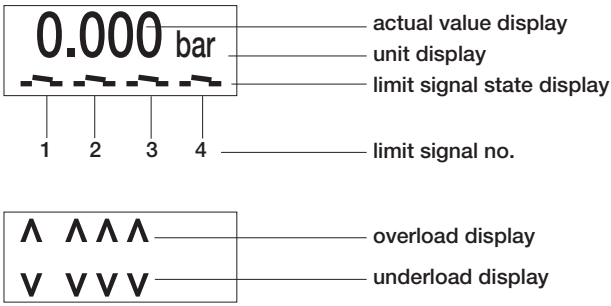
D-Sub-Connector			
PIN	RS232	RS422 / RS485 Half-Duplex	RS422 / RS485 Full-Duplex
01			
02	TxD		
03	RxD	A	+TxD
04			+RxD
05	SGND	SGND	SGND
06			
07			
08		B	-TxD
09			-RxD



1.5 Setting into operation

The measuring instrument is immediately ready for service after its installation into the measuring point and after the electrical connections have been made.
At the first commissioning, the display, in a pressureless state, indicates on the last digit 0, 0.0, 0.00 or 0.000,+/-1.
The four limit signals are open (– ~ – – ~ – – ~ – – ~ –). The limit signal numbering 1 - 4 is defined from the left to the right.



2.0 Parameter display and input

Display or input of a parameter are made via the four keys below the display. When the device is switched on, actual value and switching states of the limit signal are displayed (⎽╲⎽= open, ⎽⎽⎽⎽ = closed).
By pressing the correspondent button one of the following menus can be started:

Key	Function in the actual value display
⇔	start menu help
⇩	start display menu limit signals
↵	start input menu
⇔	-

The key functions overview is called up via help menu.
The display menu indicates in succession the lower and upper switching points of the limit signal.
The parameters are set via input menu.
In the display and input menu, the lower quarter of the disply shows the menu text. Via the keys, the desired parameter is selected as follows:

Key	Function in the actual value display
⇔	to the previous menu point
⇩	to the next menu point
↵	submenu / start parameter input
⇔	end submenu

The selected parameter is displayed in the upper part of the display. the digit/sign, which can be changed, is presented in inverse order (cursor). When entering the parameters, the key function is as follows:

Key	Function in the actual value display
⇔	change cursor position
⇩	change parameter at cursor position
↵	take over parameter / end input
⇔	reject parameter / end input

Parameter display or input will be ended by activating key ⇔ once or repeatedly, or automatically 20s after the last activation of one of the four keys.

Example:

The maximum limit value of limit switch 2 is to be changed

Key	Value	Menu text	Menu
	XX.XX bar	(limit switch display)	actual value display
↵		display min./max.	1
2x ⇩		adjust limit switch	3
↵	0000 PIN	adjust limit switch	input
⇩ / ⇔	XXX**X** PIN	adjust limit switch	input
↵		adjust 1. limit switch	3.1
⇩		adjust 2. limit switch	3.2
↵		limit switch enable	3.2.1
3x ⇩		high limit	3.2.4
↵	**X**X.XX bar	high limit	input
⇩ / ⇔	XX.X**X** bar	high limit	input
↵		high limit	3.2.4
⇔		adjust 2. limit switch	3.2
⇔		adjust limit switch	3
⇔	XX.XX bar	(limit switch display)	actual value display

Structure of input menu and parameter range

Menü	Parameter
1	**display min./max. value**
1.1	display min. value
1.2	display max. value
2	**delete min./max. value**
3	**adjust limit switch**
3.1	adjust 1.l imit switch
3.2	adjust 2. limit switch
3.3	adjust 3. limit switch
3.4	adjust 4. limit switch
3.x.1	limit switch enable ■ contact always open ↯ contact is switching
3.x.2	contact function ⊣ maximum break contact ⊢ maximum make contact
3.x.3	low limit -9999 9999
3.x.4	high limit -9999 9999
3.x.5	low limit delay 00.0...19.9 s
3.x.6	high limit delay 00.0...19.9 s
4	**integration time**
	00.0...19.9 s
5	**Datenlogger**
5.1	intervall 1s...24h
5.2	year 2000...2099
5.3	date 01.01. ...31.12.
5.4	time 00:00...23:59
6	**display unit**
6.1	choose unit mbar, bar, Pa, hPa, kPa, at, kg/cm^2, kp/cm^2, mmH_2O, mH_2O, mmWs, atm, mWs, Torr, mmHg, mmQs, psi, lb/in^2, inH_2O, ftH_2O, inHg, K, °C, °R, °F, % or customized unit
6.2	input unit (customized unit)
6.2.1	input text 2 x 5 signs
6.2.2	decimal point position 9.999 ... 9999
6.2.3	input zero -9999 9999
6.2.4	input finish -9999 9999
7	**adjust output**
7.1	measuring range zero -9999 9999
7.2	range end point -9999 9999

8	**serial interface**
8.1	baudrate 1200, 2400, 4800, 9600, 19200, 38400 oder 76800
8.2	databits 7 or 8
8.3	parity - (no parity), 0, EVEN, ODD
8.4	stopbits 1 or 2
9	**change language**
	German, English or French
10	**calibration sensor**
10.1	decimal point position 9.999 ... 9999
10.2	input zero -9999 9999
10.3	input finsh -9999 9999
10.4	calibrate zero
10.5	calibrate finish
11	**calibratie output**
11.1	input unit V or mA
11.2	input zero 00.00 ... 99.99
11.3	input finish 00.00 ... 99.99
11.4	input minimum 00.00 ... 99.99
11.5	input maximum 00.00 ... 99.99
11.6	calibrate zero 0000 ... 9999
11.7	calibrate finish 0000 ... 9999
12	**change PIN**
12.1	delete min./max. 0000 ... 9999
12.2	adjust limit switch 0000 ... 9999
12.3	integration time 0000 ... 9999
12.4	display unit 0000 ... 9999
12.5	adjust output 0000 ... 9999
12.6	serial interface 0000 ... 9999
12.7	change language 0000 ... 9999
12.8	calibrate sensor 0001 ... 9999
12.9	calibrate output 0001 ... 9999

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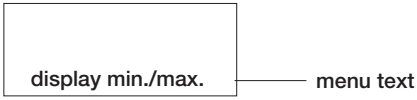
3.0 Input menu

The input menu is being started by pressing key ↵. Instead of the limit signal state, the display is showing the menu text. The upper part of the display is empty.



The starting point for the selection of a parameter in the description hereunder is the actual value display. Some of the measuring instrument functions are optional. The indications concerning multiple activations of a key (e.g. 5x ↓) refer to instruments with all options.
Menus 2 to 10 are protected through a four-digit PIN each (see menu 11 „enter PIN“).
After selection of the menu, the PIN is to be confirmed. The upper part of the display shows value „0000“ followed by „PIN“. The digit that can be changed by activating key ↓ , is marked by the cursor (inverse display). The cursor position is shifted to the left by 1 digit via key → .

Enter PIN by pressing buttons ↓ and, → and acknowledge by pressing button ↵ .
(In the event the existing PIN = „0000“, this inquiry is not applicable).

A parameter is displayed and input in the same way as the PIN.

3.1 Menu 1

Display min./max. value (maximum pointer function)
The instrument features a maximum pointer function. The minimum and maximum value are displayed.

Key	Value	Menu text
↵		display min./max.
↵	XX.XX bar	minimum
↵	XX.XX bar	maximum
↵		display min./max.
→	(actual value disp.)	(limit signal display)

3.2 Menu 2

Delete min./max. value (maximum pointer function)
Instrument features a maximum pointer function. The minimum and maximum values are set onto the actual value.

Key	Value	Menu text
↵		display min./max.
↓		display min./max.
↵	0000 PIN	delete min./max. [1]
enter the PIN via ↓ and →		[1]
↵		min./max. erased
↵		delete min./max.
→	(actual value disp.)	(limit switch display)

[1]) If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11).

3.3 Menu 3

Adjust limit switch

The measuring instrument features 4 limit switchs. For each limit switch, the following parameters can be defined:

Parameter	Set-up on delivery
1. Release: ■ contact breaks, ⊓ contact makes	always open
2. Contact function: ⊓ make, ⊔ break	make
3. Lower switching point	0
4. Upper switching point	0
5. Deceleration time of the lower switching point	0.0 s
6. Deceleration time of the upper switching point	0.0 s

Key	Value	Menu text
↵		display min./max.
2 x ↓		adjust limit switch
↵	0000 PIN	adjust limit switch [1]
via ↓ and → enter PIN		[1]
↵		adjust 1. limit switch
via ↓ select limit signal		
↵		limit switch enable
↵	■	limit switch enable
via ↓ turn release on or off		
↵		limit switch enable
↓		contact function
↵	⊓	contact function
via ↓ select make or break contact		
↵		contact function
↓		low limit
↵	00.00 bar	low limit
via ↓ and → enter switching point		
↵		low limit
↓		high limit
↵	00.00 bar	high limit
via ↓ and → enter switching point		
↵		high limit
↓		low limit delay
↵	00.0 s	low limit delay
via ↓ and → enter time		
↵		low limit delay
↓		high limit delay
↵	00.0 s	high limit delay
via ↓ and → enter time		
↵		high limit delay
3 x →	(actual value disp.)	(limit switch display)

[1]) If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11).

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3.4 Menü 4

Integration time (damping)
The measuring instrument features a damping function. The mean value will be obtained via integration time, displayed as actual value and interpreted for the output signal. Setting on delivery 0.0 (damping off).

Key	Value	Menu text
3 x ↵		display min./max.
↓		integration time
↵	0000 PIN	integration time [1]
via ↓ and →	enter PIN	[1]
↵	00.0 s	integration time
via ↓ and →	enter time	
↵		integration time
→	(actual value disp.)	(limit signal display)

[1]) If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11).

3.5 Menü 5

Data logger (optional)
By means of the data logger function, the measuring value will be stored in an adjustable time intervall. The stored measuring values can be read-out via PC. Date, hour, mean value, minimum and maximum values of the measuring value evaluated during the time intervall, are displayed for each time intervall. Date and hour are set on the actual time at the time of delivery.
Attention: After missing power supply you have to adjust the real time clock again.

3.5.1 Data logger

Key	Value	Menu text
4 x ↵		display min./max.
↓		data logger / clock
↵	0000 PIN	data logger / clock [1]
via ↓ and →	enter PIN	[1]
↵		interval
↵	XXXX s	choose interval unit
via ↓	set up measuring interval unit s / min or h	
↵		interval
↓		interval set up
↵	XX:XX X	time
via ↓ and →	set up measuring interval	0 = event control
↵		interval set up
↓		time
↵	XX:XX.	time
via ↓ and →	set up time	
↵		time
↓		date
↵	XX.XX	date
via ↓ and →	set up date	
↵		date
↓		year
↵	20XX	year
via ↓ and →	set up the running year	
↵		
2 x →	(actual value disp.)	(limit signal display)

[1]) If the PIN for this menu = „0000“, no request is made

3.6 Menu 6

Display unit
For displaying the measuring value, units such as SI, ANSI, BS and technical units are on hand, as well as a unit to be defined by the user (see 3.5.2).

3.6.1 Select unit

Key	Value	Menu text
		display min./max.
4 x ↓		display unit
↵	0000 PIN	display unit [1]
via ↓ and → enter the PIN		[1]
↵		choose unit
↵	XX.XX bar / °C	choose unit
via ↓ select the unit		
↵		choose unit
2 x →	(actual value disp.)	(limit switch display)

[1]) If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11)

3.6.2 Keying in customized unit

The measured value can be converted into other dimensions.
For the conversion, the unit with 2 x 5 signs maximum has to be entered, as well as those values that correspond to the zero point and the end point of the measuring range (see menu 9). Setting on delivery is 0.0 to 100.0 %.

Key	Value	Menu text
		display min./max.
5 x ↓		display unit
↵	0000 PIN	display unit [1]
via ↓ and → enter the PIN		[1]
↵		choose unit
↓		input unit
↵		input text
↵	%	input text
via ↓ and → enter text of unit		
↵		input text
↓		decimal point position
↵	9999 xxxxx	decimal point position
via → enter position of decimal poiint		
↵		decimal point position
↓		input zero
↵	000.0 xxxxx	input zero
via ↓ and → enter zero point		
↵		input zero
↓		input finish
↵	100.0 xxxxx	input finish
via ↓ and → enter end point		
↵		input finish
3 x →	(actual value disp.)	(limit signal display)

[1]) If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11).

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3.7 Menu 7

Setting of the analog output (optional)
By means of this menu, the relation between the analog output and the measuring range is defined. For that, one measuring point each is assigned to the zero point and end point of the analog output (see menu 10). Setting on delivery:
Zero point of analog output corresponds to zero point of measuring range.
End point of analog output corresponds to end pointof measuring range.

Key	Value	Menu text
		display min./max.
6 x ↓		adjust output
↵	0000 PIN	adjust output [1]
via ↓ and → enter the PIN		[1]
↵		measuring range zero
↵	0.00 bar	measuring range zero
via ↓ and → enter value		
↵		measuring range zero
↓		measuring range finish
↵	0.00 bar	measuring range finish
via ↓ and → enter value		
↵		measuring range finish
2 x →	(actual value disp.)	(limit switch display)

[1]) If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11)

3.8 Menue 8

Serial interface (optional)
This menu defines the data transmission format of the serial interface. Set-up on delivery: 1200 Baud, 8 data bits, no parity, and 1 stop bit. The display value is sending as ASCII characters two times per second.

Key	Value	Menu text
		display min./max.
7 x ↓		serial interface
↵	0000 PIN	serial interface [1]
via ↓ and → enter the PIN		[1]
		baudrate
	1200	baudrate
via ↓ select baudrate		
↵		baudrate
↓		databits
↵	8	databits
via ↓ select 7 or 8 data bits		
↵		databits
↓		parity
↵	-	parity
via ↓ select parity		
↵		parity
↓		stopbits
↵	1	stopbits
via ↓ select 1 or 2 stopbits		
↵		stopbits
2 x →	(actual value disp.)	(limit switch display)

[1]) If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11)

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3.9 Menu 9

Changing the language

The menu text can optionally be displayed in German, English or French. Display set-up on delivery in German language.

Key	Value	Menu text
8 x ↵ ↓ ↵	0000 PIN	display min./max. change language change language [1]
via ↓ and → enter the PIN		[1]
↵		deutsch
via ↓ select the language: German, English, French		
↵ ↵	(actual value disp.)	change language (limit switch display)

[1]) If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11).

3.10 Menu 10

Calibrating the sensor

By means of this menu, the measuring range of the sensor will be keyed in, and the output signal of the sensor at the zero and end point of the range will be measured and setup. The settings willl be made at the factory by using appropriate pressure standards. Inexpert inputs into this menu cause malfunctions of the measuring instrument.

Key	Value	Menu text
9 x ↵ ↓ ↵	0000 PIN	display min./max. calibrate sensor calibrate sensor [2]
via ↓ and → enter the PIN		[2]
↵ ↵	99.99 bar	decimal point position decimal point position
via → enter the decimal point position		
↵ ↓ ↵	0.00 bar	decimal point position input zero input zero
via ↓ and → enter zero point of sensor		
↵ ↓ ↵	10.00 bar	input zero input finish input finish
via ↓ and → enter end point of sensor		
↵ ↓ ↵	0.00 bar	input finish calibrate zero calibrate zero
Connect the measuring instrument to a sufficiently precise pressure standard. At the measuring point, generate the value shown in the display of the instrument and store via ↵ in the measuring intrument.		
↵ ↓ ↵	10.00 bar	calibrate zero calibrate finish calibrate finish
Connect the measuring instrument to a sufficiently precise pressure standard. At the measuring point, generate the value shown in the instrument display and store via ↵ in the measuring instrument.		
↵ 2 x →	(actual value disp.)	calibrate finisht (limit switch display)

[2]) To change the PIN look 3.11

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3.11 Menu 11

Calibrating the analog output (optional)

Via this menu, zero point, end point, minimum and maximum value of the analog output are being input, and the output signal will be set on zero and end point input. The settings will be made at the factory by using appropriate pressure standards.

Key	Value	Menu text
↵		display min./max.
10x ↓		calibrate output
↵	0000 PIN	calibrate output [1]
via ↓ and ⊖ enter the PIN		[1]
↵		input unit
↵		input unit
via ↓ select V or mA		
↵		input unit
↓		input zero
↵	04.00 mA	input zero
via ↓ and ⊖ enter output zero point (see rating plate)		
↵		input zero
↓		input finish
↵	20.00 mA	input finish
via ↓ and ⊖ enter output end point (see rating plate)		
↵		input finish
↓		input minimum
↵	02.00 mA	input minimum
via ↓ and ⊖ enter minimal output value		
↵		input minimum
↓		input maximum
↵	22.00 mA	input maximum
via ↓ and ⊖ enter maximum output value		
↵		input maximum
↓		calibrate zero
↵	0000	calibrate zero
Connect the analog output to a sufficiently precise pressure standard. Key in the figure in such a way that the pressure standard shows the value indicated for the zero point.		
↵		calibrate zero
↓		calibrate finish
↵	0000	calibrate finish
Connect the analog output to a sufficiently precise pressure standard. Key in the figure in such a way that the pressure standard shows the value indicated for the end point.		
↵		calibrate finish
2 x ⊖	(actual value disp.)	(limit signal display)

[1]) To change the PIN look 3.11

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3.12 Menue 12

Keying in the PIN

Menus 2 to 10 are protected by means of a 4-digit PIN each.
On delivery the values will be set as follows:

Menue	PIN	Menuetext	
2	0000	delete min./max.	[1])
3	0000	adjust limit switch	[1])
4	0000	integration time	[1])
5	0000	display unit	[1])
6	0000	adjust output	[1])
7	0000	serial interface	[1])
8	0000	change language	[1])
9	1000	calibrate sensor	[2])
10	1000	calibrate output	[2])

[1]) If the PIN for this menu = „0000“, no request is made
[2]) PIN must not be = „0000“ to be able to change these parameters

Each PIN can be set individually via menu „enter PIN“. The menu call-up is made by the following key combination:

Key	Value	Menu text
↵		display min./max.
11x ↓		change PIN
↵	PIN	delete min./max.
↵ change PIN ↓ to the next PIN → to the previous PIN ↵ break-off PIN input After breaking off or input of the last PIN, the display shows:		
↵	(actual value disp.)	change PIN (limit switch display)

After selecting the menu, the existing PIN has to be confirmed. In the upper part of the display the value „0000“ is indicated followed by „PIN“. The place that can be changed via key ↓ is marked by the cursor (inverse display). Via key → , the cursor position is shifted to the left by one digit.

Key in the existing PIN by keys ↓ and → and confirm via key ↵ . (In the event that the existing PIN = „0000“, this inquiry is not appliable).
In the upper part of the display, the value „0000“ is shown followed by „new PIN“.

Key in the desired new PIN by pressing the keys ↓ and → and confirm by key ↵ .

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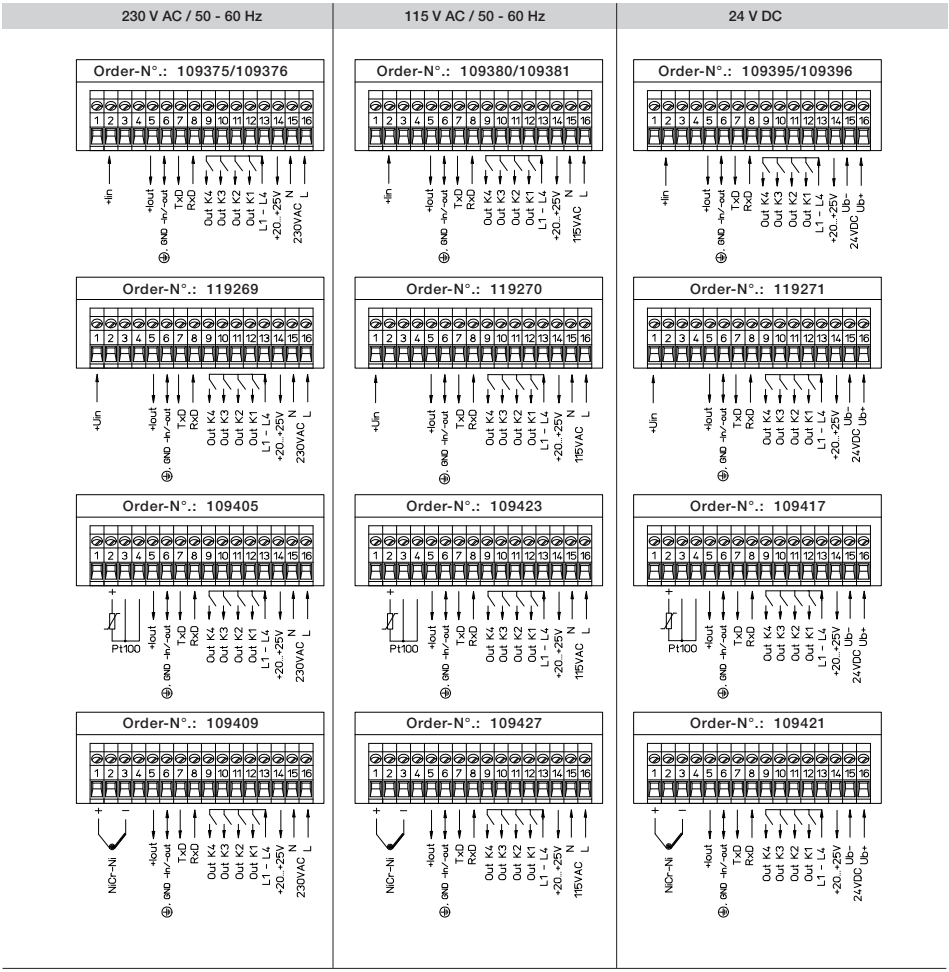
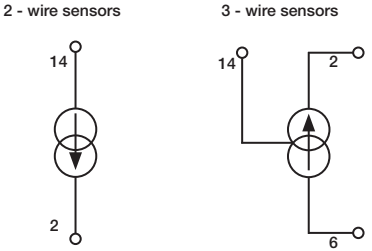
4.0 Wiring details



Wiring exsamples



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Quality for the future